

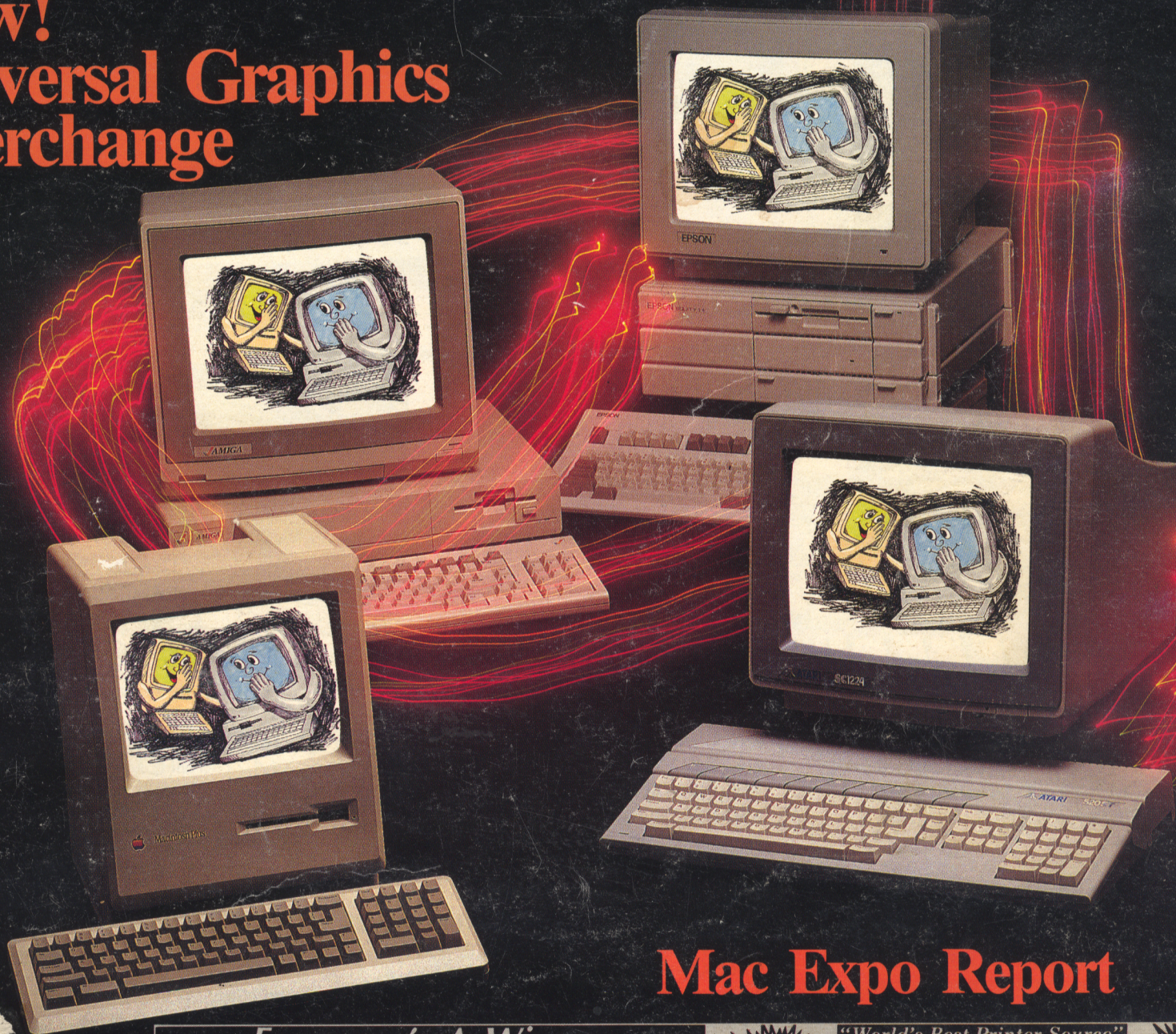
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ATARI ST

Hacking The ST

by Wynn Rostek

Hello out there in ST land, no I'm not dead. I just recently accepted a position with Lockheed and started graduate school. Things were busy before, but now they are really busy.

If you have not noticed, I also write the math pack column, and once in a while I do a special project like the PC board production system. With all the other things going on I don't have enough time to do 2 or 3 columns a month for *Computer Shopper*, but I will continue to do what I can.

What this means to you is that this column may not appear every month (in case you haven't noticed) but that doesn't mean I have given up on the ST. In the meantime, others will continue to review new ST programs so you will be kept up to date.

A quick rundown on where we stand. Atari users are still waiting for blitter chips (it's nice when a prediction comes true, but how long will folks wait for a blitter until they start looking at PC clones where prices have gone through the floor?)

The mega STs are going to show up "any day now." (Maybe we have stumbled across the new Atari motto?) As time has gone on, the details on the laser printer have become more fuzzy. I always thought that as you got closer to release the details got clearer. Obviously one of two things is occurring. Atari has come to the realization that a laser printer is too pricy for the "home/hobbyist" market, (whatever happened to the CD disk?) or somehow I have become very confused about how this business works. I leave it to the reader to decide which it is.

On the good news front, there are very serious indications that new ROMs are being developed that need the blitter to work. Some bugs have been fixed, but many remain. I suspect it will be quite a while until the blitters can be retrofitted into existing 520s and 1040s. There is a slight possibility that there will be no official backfit. (That won't stop the advanced hackers from grafting the chip into their system, and with enough demand (\$\$\$) third party support for this will develop.)

Speaking of grafting chips to the ST, Dave Stevens, one of

our Canadian readers, is looking for a vendor that sells a Motorola Floating point modification. I have not heard of anyone that actually sells this modification. As a matter of fact, I have not even heard of anyone that has added the co-processor to his own machine, but I'm sure someone has tried it. Adding it seems to be a simple case of soldering pins together, with little impact on bus timing or other "worrysome" areas. If anyone has performed this modification how about sharing news of it with the rest of us? (I suspect you could pick up a little extra money by doing an article about it!)

While many Atari fans have been waiting for quite some time for the Mega STs, I have a pet theory about when they will show up. At the present time the 1 megabit chips are about \$20. With 16 memory chips per mega, you're looking at \$320 for memory chips alone. This is simply way too high a price for Atari to be able to market the machines. I don't think we'll see more than a trickle of the new Mega STs until the memory chip prices fall drastically. I don't look for any significant number of machines to show up until the memory prices drop to about \$5 a chip.

While Atari has taken a lot

of heat over the delayed release of the Mega line, I don't think they deserve it. If you want to design a really top-notch computer for the personal computer market, you design it with the parts that are coming out of the labs at the time. Since there are several re-designs and then all sorts of additional work to do (advertising campaigns to kick off, government certifications to get, production problems to be worked out, etc.) you know that chip prices will fall by the time you actually ramp up to full production.

For quite some time, memory prices have been following a fairly well-known curve. I'm sure that when Atari started the Mega ST design, they were well aware of projected prices of the 1 megabit memory chips, and designed their pricing structure around it. Along came the unfair trade practice suits (Japanese dumping of memory chips below cost in America in order to keep volumes up) and the American reaction to it (Keep Japanese chip prices high by tariffs, reduced production, etc.) and guess what happened to the price curve of the 1 megabit chips? Completely out the window! If you have to scream at someone over this, write your Congressman, not Atari.

On to other topics, where is

the ST software? There has been a bit of a slump in the release of serious (utility) software for the ST, but games are doing fairly well. PD software on the ST is doing quite well. Summer is always soft for the computer business so we will need to wait for the end of the Christmas season to get a good feel what 1988 may have in store. My prediction is continued gains in games sale at the expense of utility software. (An exception will be in page layout software, the ST is a natural for this. Look for a strong showing in the "CAD/CAM" type programs

for the ST, someone will make good money with one some day.)

A soft market means that lots of people are looking for ways to increase sales. New versions are always a safe bet, they allow you to tap existing customers for a good portion of your up-front money. Completely new programs always sell well for the first few months they're on the market, but bringing a new product to market isn't as easy as pulling a rabbit from a hat (nor as risk free).

continued on page 160

Listing 1

```

DEFINT S
DEFINT T
DEFINT P
DEFINT Q
DEFINT I
DEFINT R
DEFINT G
DEFINT B
DEFINT C
OPTION BASE 0
DIM C(16)

REM INITIALIZE THE COLOR VALUES
R = 0
G = 0
B = 0

REM SAVE THE OLD PALLETTE
P = 7
Q = -1
FOR I=0 TO 15
  XBIO$ P,I,Q
  C(I) = STATUS$
NEXT

REM SHOW ALL POSSIBLE COLORS
FOR S=0 TO 511
  T = (B + (G * 16) + (R * 256))
  FOR I=0 TO 15
    XBIO$ P,I,T
  NEXT I
  GOSUB BUMP
NEXT

REM RESTORE THE ORIGINAL PALLETTE
FOR I=0 TO 15
  XBIO$ P,I,C(I)
NEXT

END

REM THIS SUBROUTINE BUMPS THE COLORS
BUMP: B = B + 1
IF (B < 8) THEN RETURN
B = 0
G = G + 1
IF (G < 8) THEN RETURN
G = 0
R = R + 1
RETURN

```

Listing 2

```

CLR.b (A5)
CLR I2(A5)
MOVE #11,4(A5) SOURCE LINE 11 /* DIM C(16) */
CLR.b (A5)
MOVE #16,(A7)
MOVE #1,-(A7)
CLR -(A7)
JSR E_ARRDIN
ADDQ.I #4,A7
MOVE #14,4(A5) SOURCE LINE 14 /* R = 0 */
CLR.b (A5)
CLR -16(A6) SOURCE LINE 15 /* G = 0 */
MOVE #15,4(A5)
CLR.b (A5)
CLR -14(A6) SOURCE LINE 16 /* B = 0 */
MOVE #16,4(A5)
CLR.b (A5)
CLR -12(A6) SOURCE LINE 20 /* P = 7 */
MOVE #20,4(A5)
CLR.b (A5)
MOVE #7,-10(A6) SOURCE LINE 21 /* Q = -1 */
MOVE #21,4(A5)
CLR.b (A5)
MOVE #-1,-8(A6) SOURCE LINE 22 /* FOR I=0 TO 15 */
MOVE #22,4(A5)
CLR.b (A5)
CLR -6(A6) SOURCE LINE 22 /* FOR I=0 TO 15 */
L1:
MOVE #22,4(A5) SOURCE LINE 22 /* FOR I=0 TO 15 */
CLR.b (A5)
CMPI #15,-6(A6)
BGT L2
MOVE #23,4(A5) SOURCE LINE 23 /* XBIO$ P,I,Q */
CLR.b (A5)
MOVE -8(A6),(A7)
MOVE -6(A6),-(A7)
MOVE -10(A6),-(A7)
JSR E_XBIOSS
ADDQ.I #4,A7
MOVE #24,4(A5) SOURCE LINE 24 /* C(I) = STATUS$ */
CLR.b (A5)
MOVE -6(A6),(A7)
MOVE #1,-(A7)
CLR -(A7)
JSR E_ARRREF
ADDQ.I #4,A7
MOVEA.L A0,A3
MOVE 14(A5),D0
MOVE D0,(A3)
MOVE #25,4(A5) SOURCE LINE 25 /* NEXT */
CLR.b (A5)
ADDQ #1,-6(A6)
BRA L1
L2:
MOVE #29,4(A5) SOURCE LINE 29 /* FOR S=0 TO 511 */

```

Listing 3

```

S_ARR_NO .dc.w $1
S_ADES_LEN .dc.w $10
S_VAR_LEN .dc.w $10
S_ISCOM .dc.w 1
S_DBLV_NO .dc.w $0
S_INTV_NO .dc.w $8
S_SNGV_NO .dc.w $0
S_STRV_NO .dc.w $0
S_RAMRET .dc.l $4000
S_RAMRES .dc.l $0
S_ARR_TYPES:
S_CST_DATA:
S_CST_STR:
S_CSTDBL:
S_COMM_MAP:
S_ARR_DES:
S_ARRATR:

```

Listing 3 continued on page 294

The Best Of ST Public Domain

Reviewed by Robert Westcott

In this month's column, I will share with you about one of the best utility programs, not only for the ST, but in the Utility Program genre, period.

DCOPY20.TOS, so named because it is version 2.0 of Ralph Walden's DCOPI program, is one of the most versatile and easy-to-use utility programs on the market. Offered as shareware, with a request for a mere \$5 donation, it runs circles around programs retailing for ten times that sum, and takes the place of numerous other utility programs that might be filling up your disks.

DCOPY replaces the programs you used for formatting,

copying, file manipulation, archive handling, file conversion, file display, and even screen blanking. Surprisingly, it does all these functions fully, and in some cases better than the individual programs.

DCOPY can be run optionally as a .PRG, .TOS, or .TTP program. As a .PRG program it makes minimal use of the GEM interface, but allows for file selection in some of its activities via a file selector box. Run as a .TTP program, it can be given parameters in its callup, saving time if you know the program well. Run as a .TOS program, which is my preference, it lists the commands for you on the screen, and guides you through the process you choose.

DCOPY is user-friendly, and could be used with a little experimentation without reference to the excellent documentation that comes with the program.

DCOPY does a number of things, and does them all well.

With respect to formatting, DCOPI offers not only the standard GEM format of 80 tracks/9 sectors, but also up to 82 tracks and the option of ten sectors. If you push it to the limit (i.e. 82 tracks and ten sectors) you get a single-sided disk with a capacity of 403K, as opposed to 357K for standard format. Formatting a double-sided disk this way doubles these numbers. In certain conclusion—twisted is faster, but at least in this brief experiment, not that much faster and

maybe not worth the extra effort.

File manipulation is fully implemented and a snap with DCOPI. You can copy single files, multiple files, folders, and whole disks, and you can copy them to a drive, or to the Printer, assuming you have one. Wildcarding is allowed.

A separate disk duplication function in the program allows for the duplication, not only of standard disks, but extended and twisted format disks as well. It will not duplicate copy protected disks.

Getting a directory of your disk, hard drive, or subdivision thereof is easy DCOPI, and again, you have your choice of screen or printer output. The printer output can be especially handy if you're like me and col-

lect a lot of programs and then forget what's on the disks.

Both files and folders can be trashed with DCOPI, though I wouldn't go to the program for that sole function. GEM does these things quite well, thank you.

As an added bonus, DCOPI gives you a "control X" extract function for use when the .ARC file and the destination files will not fit on one disk and you only have one disk drive (or choose to use only one). The program will prompt you when to change disks.

Archived files can be deleted, freshened, updated, and tested for integrity. The difference between updating and freshening is that updating not only replaces .ARCD files when there is a newer version, but also adds files that fit in the parameters you have set.

The archive manipulation in this program is simply the fastest and easiest to use I have encountered, and I have put my other archive programs in mothballs.

A super feature of DCOPI is the type-convert function. This function will load a file, convert all control characters to spaces, and word wrap the file to whatever you set your right margin to. As a frequent BBS user, I find this feature most useful, especially with the advent of on-line magazines like *Infomat*, which comes in a non-standard format. Having converted the *Infomat* file with this program, I can now read all of it. With this function, you can save the converted file and give it a file name of your own choosing.

Type-convert also includes a search function that allows you to search for a string in a file, and when it searches, it does it fast (roughly 150K per second).

Another type of conversion implemented in this program, and of use to those owning more than one type of computer, is the eight to sixteen bit conversion option, and its sister, the sixteen to eight bit conversion option. For the XL owner, or even that rare person that likes both regular "Apples" and "Jackintoshes," this is a great feature.

Along the same lines, conversion facility is available to convert STWRITER files to ASCII, STWRITER returns to eight-bit returns, and to strip out most returns, period, from a document to prepare it for reformatting.

With the "-H" function, DCOPI allows you to browse a file one screen at a time, and

```

DCOPY 2.00 Shareware by Ralph Walden, 1821 Jefferson, Eugene, OR 97402
#DANDSKUTS
D-directory
J-directory search
C-copy files
M-move files
E-erase files
L-lock files
R-rename a file
H-hide files
U-unlock/unhide files

T-type (display) file
AT-set right margin for Type

V-write verify on/off
M-default drive/folder (change)

F10-Enter command line
Alt H-Alternate menu
Q-quit (exit to desktop)

F-format disk
Z-duplicate disk

X-extract .ARC files
I-extract with query
V-view filenames in .ARC
A-create .ARC file

S-space on disk

M-New folder
K-kill (delete) folder

1-16 bit >> 8 bit text
2-8 bit >> 16 bit text
3-STwriter >> 16 bit text
4-STwriter >> 8 bit text
5-Strip returns

Write verification is ON Buffer:386544 Type:margin:80
Command: DCopy Menu

```

```

DCOPY 2.00 Shareware by Ralph Walden, 1821 Jefferson, Eugene, OR 97402
#DANDSKUTS
ALTERNATE MENU -- Press minus key and command
-A append file
-H hex dump

-D delete file within .ARC file
-F freshen files within .ARC file
-U update files within .ARC file
-T test .ARC file integrity

-N normal color
-M white on black screen
-G green on black screen

-O screen off

Command:

```

Hacking The ST continued from page 159

Soft markets bring interesting new methods of distributing software. Witness the shareware market. The reason the shareware market developed was that most software distributors were not willing to give the writer of a program more than \$1 per copy of his part of the "effort." Gearing up to market a product is not too expensive (about \$25,000 will give you a nice start) but advertising costs are way too high. (One of the reasons for the size of *Computer Shopper* is that ad prices are below the level that most other magazines charge.)

The logical choice for someone with a viable product that doesn't want to give it to a multi-million dollar company or \$1 a copy is to put it up on bulletin boards and ask for donations. Not many people actually send you the money, but your distribution and advertising costs are non-existent. Anything you get is gravy.

A new marketing idea is be-

ing tried on the ST market right now. DTACK Grounded Inc. is giving away labels for their BASIC. They are asking people to freely copy the disk, but by using the supplied labels (complete with copyright notice) the copies become "legal" copies. Instead of the warm feeling you get by making a donation to your favorite shareware author, they offer a DBASIC manual for your money (along with a disk containing the most current version of the program).

Giving the program away and selling the manual is something that most people have heard of, but in the past it has been a joke about the \$500 programs that one finds "instructional" manuals about at the local bookstore. (The inside view is that the reason that the *Guide to Lotus 1-2-3* type of book sells so well is that people steal a copy of the program from work, then buy a manual from the local bookstore. I don't know if this is really true, but it sounds plausible to me.)

The folks at DTACK Grounded Inc. seem to have

taken this old saw to heart, and are in the process of giving it a try. It will be interesting to see what comes of this. The ST market is still innovative!

I'm not sure that DBASIC is a good test of this strategy, while the speed claims for the product sound very good, it is an extremely non-standard package in that it is not even a TOS based product. The only way to run DBASIC is to boot the disk, you can't even list the contents from TOS due to a custom disk format. Look for a review of this product in an upcoming issue.

Speaking of BASIC, (one of my least favorite things) I thought I would take a bit of this column to go over the LDW BASIC compiler interface to assembly language. (It has taken a while due to many other interrupts being on the queue, but I have finally gotten around to it.)

The fine folks at LDW seem to have done their homework. Version 1.1 of the compiler seems like a good tool for BASIC programmers looking to make a transition to

assembly language programming. The two disks provided have a BASIC compiler and a linker, along with many demo programs for you to try.

The reason this BASIC is worth considering is that by setting the binary option off, the compiler will produce assembly language output. The package does not include an assembler (they recommend using as68 from the developers package) but there are several PD assemblers for the 68000 that can be had for a little download time.

Compiling to assembly language and then adding my routines is one of the ways I add assembly language to C, however I will usually write an entire routine in assembly language and then simply call it from C when I need to get the job done.

An additional advantage of handling assembly language the way the LDW compiler does it is that you can look at the assembly language output of a short BASIC fragment to

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What's Wrong continued from page 139

IIGs press release states: "The Apple IIGs will not make any existing Apple computers obsolete or replace them in major market segments. The IIGs is intended to provide new capabilities for users in many market segments, especially those in which advanced graphics or sound is important." In other words, according to Apple's own press releases, the IIGs should only be used by Apple IIe owners who want more graphics and sound capabilities, and not surprisingly most of the few programs available for the IIGs are either graphics or sound oriented. So much for support from within the company.

Software and developer support is even more frustrating for the baby IIGs. When Apple's developer department was first established, its only goal in life was to assist Macintosh developers—Apple II family developers were left on their own. Two magazines produced outside of Apple, with Apple's support, *Mac Marketeer* and *The Macintosh Buyer's Guide* were distributed through dealers for several years, however the Apple II equivalent, the *Apple II Review*, wasn't started until last year. From 1984 to 1986 the only support the Apple II received was *Apple II Forever* shows.

Why all of the support for the Mac, and very little if any support for the II? With the simultaneous introduction of the original Macintosh and Apple IIc computers in 1984, Apple split its operations into three divisions: Apple II (Del Yocam Exec VP), Apple 32 (Mac & Lisa with Steve Jobs as Exec VP), and Accessory Products Division (APD with Mike

The Best Of ST continued from page 160

unlike the GEM screen print, it allows you to move back and forth throughout the document.

DCOPY allows those with color monitors to change the screen to green letters with a black background, and allows all users to blank out the screen. The only problem with the latter function is that your last command line it displays, and hence, not a total blackout.

Bugs? Yes, but tolerable bugs. DCOPY does not like Thunder, gives you a flashing, useless screen when Thunder is in place. This was the only real bug I found.

Suggestions for improvement? Yes, why not make this an Accessory, a la Sidekick, so that the functions would be quickly available, without hav-

Muller as its head). With Apple founder Steve Jobs as the head of the 32 bit Apple department it received much more support than the other divisions. The Apple III Plus was cancelled, even though it was still selling well, since it competed too closely with the brand new 128K Mac. Contrary to popular opinion, the Apple III was one of the best selling computers available in 1984—its sales only looked small in comparison with the IIe, and the computer still sells well through remarketers. In the Mac's defense it must be said that since it was a brand new computer, with very little software available (for quite a while MacWrite and MacPaint were the only products available), it needed more software and marketing support than the already existing, and well supported Apple II family members.

When Steve Jobs left Apple much of his bias against the Apple II series left with him. The long lost Apple IIX project was revived, and with many improvements eventually became the IIGs. Apple II developers were provided with their own technical support members, and Apple II received more marketing support. Unfortunately the spirit of Steve Jobs hasn't been totally exorcised. The Apple IIGs' own introduction press release includes a backhanded stab—"The Macintosh line, with its powerful Motorola 68000 microprocessor and large library of business software, is aimed at business markets and universities." Right. Apparently there are still marketing people who believe that if you add more bits to a microprocessor it automatically becomes a more powerful computer, and forget that there are hundreds of business programs, and

ing to insert a disk and call up the program.

Another suggestion—port this to MSDOS so those of us in the PC and Clone world can have the benefit of this excellent software.

DCOPY has been evolving for some time, and gets better with each revision. It is an example of Shareware at its best, and should be supported with a contribution to the programmer, Ralph Walden (1821 Jefferson, Eugene, OR 97402).

As I stated in the first edition of this column (which just came out as I was writing this one,) this is your column. Let me know what you've found to be the best of ST public domain. My GENie mailbox is R. WESTCOTT, or just send your suggestions to *Computer Shopper* via mail or on Delphi.

Support Shareware—it's in your best interest to do so. ●

thousands of businesses using Apple IIs. The attitude too many people, including Apple executives, have is that the II family is based on 10 year old hacker technology, and has no place in the present, or future microcomputer industry—totally ignoring both the established database of satisfied Apple II family owners, and the expansion potential of the 65816 powered IIGs.

While Apple's Developer Support services are giving much more support to the II family than ever before, the Mac still gets preferential treatment. The Mac access software for Applelink, Apple's own network for communicating with developers and dealers, was released well before the Apple II version, which is still in Beta test. In addition, Mac developers receive updates much quicker and more easily than Apple II developers. Apple sent all of its developers and dealers updated versions of the System and Finder utilities, but developers are finding it very difficult to obtain recent updates to the Apple IIGs versions of ProDOS 8, ProDOS 16, and the printer utilities. The July issue of the Developer newsletter states "In late May, version 2.0 of the Apple IIGs System disk was released to software licensing. Those of you already licensed for ProDOS 16 should have received updates automatically. If you aren't licensed, you can either obtain an updated version through your dealer or you can contact Software Licensing to become

continued on page 297

Hacking The ST continued from page 160

get a better idea of how to handle a task. Many times you will know how you could do something in BASIC, but are a little fuzzy about how to go about it in assembly language. Just write a short BASIC program, compile it and look at the assembly output. Several short experiments should put you on the right track.

With the short blurb out of the way, let's look at some code. Listing 1 (page 159) is a short program in BASIC to display all the different colors the ST is capable of generating. As written, the colors flash past too quickly to get a good look at. What is needed is a delay routine to slow down the display. (By the way, the program is a conversion of a C program from an earlier column.)

By setting the binary option off, and the trace option on, the LDW compiler will produce an assembly listing with "line markers" in it. A short section of the code generated is shown in Listing 2 (page 159). Two instructions are used to store the current line number in a global variable so when an error occurs the program can identify which source line caused the problem.

The two instructions are MOVE #XXX,4(A5) and CLR.b (A5). The XXX is the source line number and the assembly language that follows is the code that your BASIC statement was compiled into. In the final version of your program you may well want trace

set to off, but when you are still debugging (or writing) it helps to be able to quickly locate a given line.

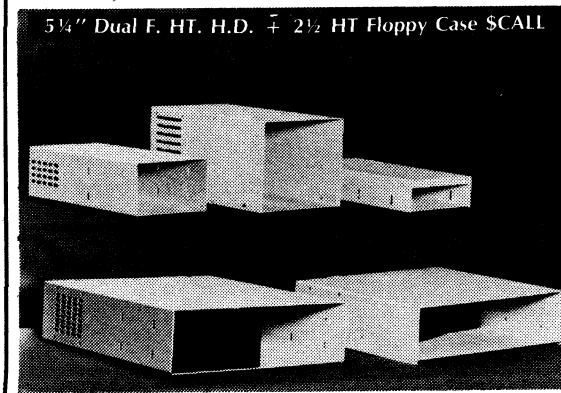
By noting which line should be followed by a call to the delay routine, it is a very simple matter to go into the assembly language code and add the assembly language call. (Remember that parameters are pushed to the stack in the reverse order they appear in the source code whenever you pass more than 1 parameter.)

Listing 3 (page 159 & 294) is the complete assembly language listing for the program produced by the LDW compiler, and the assembly code added to produce the needed delay. (This version was compiled with trace off to shorten it.) The note indicates where code was added to make the call to delay. The delay routine itself appears at the end of Listing 3. To add the needed delay, we push the delay value to the stack and then perform the JSR instruction. (The addq.l instruction reclaims the stack space used by the parameter passed to delay.)

At first you can just tack on your assembly routines to the end of the assembly file generated by the LDW compiler, but later when you have collected a large number of routines, put them in a library file and link them in. I used the link68 program to link the assembler program, baslib, and mathlib as needed to produce the finished program. (You can also use the linker supplied by LDW as part of the package.) ●

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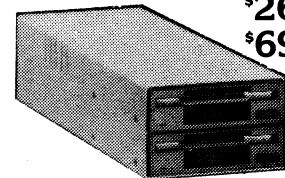
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Listing 3 Hacking The ST

continued from page 159

```

SYS BASE:
S_STAT NO: .ds.b 1
S_ISERR: .ds.b 1
S_ERR ST: .ds.b 1
S_LINE NO: .ds.w 1
S_ERR NO: .ds.w 1
S_ERR LN: .ds.w 1
S_TRAP OFF: .ds.w 1
S_BASE: .ds.w 1
S_STATINT: .ds.w 1
S_DATA PTR: .ds.1 1
S_SEG_VAL: .ds.1 1
S_FRAME: .ds.1 1
S_STACK: .ds.1 1
S_CURSTACK: .ds.1 1
S_INSNO: .ds.1 1
S_ERRINS: .ds.1 1
S_RET DBL: .ds.1 2
S_STATUS: .ds.1 2
S_DEADSTR: .ds.1 20
*
* You have to preserve the registers,
* so we use some local storage
*
* here we have our register save areas
sval: ds.1 16
I_init:
MOVEA.1 4(A7),A5
S_params:
JSR E BASINIT
JSR E GEMINIT
BSR.b IL2
JMP E_EXIT
IL2:
LINK A6,#-32
MOVEA.1 A7,A0
MOVEQ #15,D0
IL3:
CLR (A0)+
DBF D0,IL3
MOVE.1 A6,26(A5)
MOVE.1 A7,30(A5)
MOVE.1 A7,34(A5)
MOVE #10,4(A5)
CLR.b (A5)
CLR 12(A5)
MOVE #11,4(A5)
CLR.b (A5)
MOVE #16,(A7)
MOVE #1,-(A7)
CLR -(A7)
JSR E ARRDIM
ADDQ.I #4,A7
MOVE #14,4(A5)
CLR.b (A5)
CLR -16(A6)
MOVE #15,4(A5)
CLR.b (A5)
CLR -14(A6)
MOVE #16,4(A5)
CLR.b (A5)
CLR -12(A6)
MOVE #20,4(A5)
CLR.b (A5)
MOVE #7,-10(A6)
MOVE #21,4(A5)
CLR.b (A5)
MOVE #-1,-8(A6)
MOVE #22,4(A5)
CLR.b (A5)
CLR -6(A6)
L1:
MOVE #22,4(A5)
CLR.b (A5)
CMPI #15,-6(A6)
BGT L2
MOVE #23,4(A5)
CLR.b (A5)
MOVE -8(A6),(A7)
MOVE -6(A6),-(A7)
MOVE -10(A6),-(A7)
JSR E XBIOSS
ADDQ.I #4,A7
MOVE #24,4(A5)
CLR.b (A5)
MOVE -6(A6),(A7)
MOVE #1,-(A7)
CLR -(A7)
JSR E ARRREF
ADDQ.I #4,A7
MOVEA.1 A0,A3
MOVE 14(A5),D0
MOVE D0,(A3)

```

```

MOVE #25,4(A5)
CLR.b (A5)
ADDQ #1,-6(A6)
BRA L1
L2:
MOVE #29,4(A5)
CLR.b (A5)
CLR -4(A6)
L3:
MOVE #29,4(A5)
CLR.b (A5)
CMPI #511,-4(A6)
BGT L6
MOVE #30,4(A5)
CLR.b (A5)
MOVE -14(A6),D7
MULS #16,D7
ADD -12(A6),D7
MOVE -16(A6),D6
MULS #256,D6
ADD D6,D7
MOVE D7,-2(A6)
MOVE #31,4(A5)
CLR.b (A5)
CLR -6(A6)
L4:
MOVE #31,4(A5)
CLR.b (A5)
CMPI #15,-6(A6)
BGT L5
MOVE #32,4(A5)
CLR.b (A5)
MOVE -2(A6),(A7)
MOVE -6(A6),-(A7)
MOVE -10(A6),-(A7)
JSR E XBIOSS
ADDQ.I #4,A7
MOVE #33,4(A5)
CLR.b (A5)
ADDQ #1,-6(A6)
BRA L4
L5:
*
* NOTE:
*
* Here is where the code has been inserted
* to provide a slight pause between colors
*
move.w #500,-(sp) * ask for 1/2 second delay
jsr delay * call our delay routine
addq.1 #2,sp * clean up the stack
PEA IL4
SUBQ.1 #8,A7
BRA L9
IL4:

```

```

ADDQ.1 #8,A7 D
RTS
LB:
MOVE #53,4(A5)
CLR.b (A5)
CLR -14(A6)
MOVE #54,4(A5)
CLR.b (A5)
ADDQ #1,-16(A6)
MOVE #55,4(A5)
CLR.b (A5)
ADDQ.1 #8,A7
RTS
E_ERR_TRAPS:
NOP
*
* Here are the routines we added, they
* are just tacked onto the end of the file
*
* this routine returns after x milliseconds
* note that it handles 0 milliseconds correctly
*
_delay: movem.l d0-d1,sval * save register
         move.w 4(sp),d0 * number of milliseconds
dip:    tst.w d0 * check for 0 delay
        beq delret * if done...
        jsr killms * wait a bit
        subq.w #1,d0 * one less pass to do
        bra dip * and try again
delret: movem.l sval,d0-d1 * restore register
        rts

```

```

* this routine returns after 1 millisecond
*

```

```

* it does not save and restore d1 because it is normally
* called from _delay which handles the registers
*

```

```

killms: move.w #274,d1 * number of loops
killup: dbf d1,killup * wander around aimlessly
killret: rts

```

```

MOVE #35,4(A5) C
CLR.b (A5)
ADDQ #1,-4(A6)
BRA L3
L6:
MOVE #40,4(A5)
CLR.b (A5)
CLR -6(A6)
L7:
MOVE #40,4(A5)
CLR.b (A5)
CMPI #15,-6(A6)
BGT L8
MOVE #41,4(A5)
CLR.b (A5)
MOVE -6(A6),(A7)
MOVE #1,-(A7)
CLR -(A7)
JSR E ARRREF
ADDQ.I #4,A7
MOVE (A0),(A7)
MOVE -6(A6),-(A7)
MOVE -10(A6),-(A7)
JSR E XBIOSS
ADDQ.I #4,A7
MOVE #42,4(A5)
CLR.b (A5)
ADDQ #1,-6(A6)
BRA L7
L8:
UNLK A6
RTS
L9:
MOVE #48,4(A5)
CLR.b (A5)
ADDQ #1,-12(A6)
MOVE #49,4(A5)
CLR.b (A5)
CMPI #8,-12(A6)
BGE LA
MOVE.b #1,(A5)
ADDQ.1 #8,A7
RTS
LA:
MOVE #50,4(A5)
CLR.b (A5)
CLR -12(A6)
MOVE #51,4(A5)
CLR.b (A5)
ADDQ #1,-14(A6)
MOVE #52,4(A5)
CLR.b (A5)
CMPI #8,-14(A6)
BGE LB
MOVE.b #1,(A5)

```

CLASSIC COMPUTERS

Classic Computers are systems that are either not being manufactured at this time, or are no longer the prime members in their company line. What makes them Classic is the number of users they retain in spite of their age. Classic Computer users do not give up their older and faithful machines for a new pretty keyboard and screen. They have

interests beyond the superficial and changing styles of the day. They maintain that one cannot get to really know a computer system in a few years. They also are unwilling to give up their expertise to become another flag waver for a fleeting fashion. ●

Stan Veit—Editor-In-Chief

suggest that he read the contribute knowledge and questions to this wonderful column!

prepared the "BASIC 7.0 Commands" that are printed in this article. Cut them out and keep them handy. It saves a lot of time digging through books.

BASIC Commands

Speaking of tough parts, I, like probably most of you when you started, had to dig out of the manuals the information I needed. Having done that I don't even try to remember all those commands. As a rule, my work and play with a computer is done within a program so it's only occasionally that I need to know how to send commands in direct mode to a printer or what the dip switch settings are for the drives. I, therefore,

Word Writer 128

From Bob in Huntsville: **Question:** In your April '87 column on Word Writer 128 you said, when discussing entering special printer codes using the Set Printer option, "The rub is that after you enter the codes and press return, WW128 does not tell you whether or not you were successful. It

continued on page 184

COMMODORE

Getting The Most From Your C-128

by Patrick A. Tillery

I Am The C-128

We computer nuts, hobbyists, hackers, enthusiasts, and whatever, are a strange but helpful breed. It is almost pathetic how eager we are to help new computer users. Perhaps we are subconsciously trying to justify the existence and expense of our minor vice...computers. Perhaps we subscribe to the old "misery loves company" saw. Or perhaps we are just nice guys and gals who love to help a newcomer!

It is said that the single greatest thing that sets off humanity is our ability and eagerness to tell others of our discoveries and knowledge or simply our compulsion to communicate. There might be some justification for one group or another to hoard its hard-earned knowledge, but, instead, notice how scientists rush to publish papers and gossips rush to the back fence. If this is true, we computer nuts are certainly human even if there is sometimes sharp disagreement in some quarters. Because of this, the best advice that I can give someone with a brand new computer is "join a users group." They are always ready and willing to help. Barring that, however, this little program, "I am the C-128," like its predecessor, "I am the C-64," is a must. I sure wish I had had access to one of these when I first started!

My first reaction while "I am the C-128" was loading was that I enjoy reading the credits while they slowly type across the screen the first time! But I surely don't want to sit through it every time I load the program. To those of us who can't wait until we read the instructions to look at a program, this often happens. Later, looking at the documentation, I discovered that the programmers were away ahead of me. When the credits start, simply press F1 and away we go...the credits are skipped! When you do this, though, you skip the commands, which are few and simple but so that you can skip them and speed up the entry, here they are:

I Am The C-128 Commands

Table of contents, return to	F1
Volume Menu, return to	ESC
Continue	<R> or Space Bar
Prev. screen	up arrow
Next screen	down arrow
Help	HELP

Like any good tutorial, it allows you to stop and, using the Table of Contents and the Volume menu, return to where you left off.

Probably, if you are advising a new user, you should tell him to look through the entire tutorial just for fun, but stop studying after Chapters 1, 2, 3 and 5 until he has gained some experience. Then go on to the 4th and 6th through 9th Chapters. The "Introduction" (Chapter 1) simply tells in general terms how the computer works and what software categories are available. The program goes on with clever graphics and sound to Chapter 2, "The C-128." This chapter is a must for the newcomer. It covers the keyboard very well. It takes a cursory look at the monitor and disk drives and mentions the printer, joysticks, and mouse. Chapter 3 tells all that a casual user of the computer needs to know about BASIC. It covers operations that he must be able to do in direct mode plus a little simple programming. At this point, skip to Chapter 5 and learn about disk usage: how to load, save, format, copy and erase. Then start using the computer with programs and save the rest for later.

Later, when he is about to get serious about programming in BASIC he can go on to Chapter 4, "Advanced BASIC." This helps by making the concepts of loops, strings, variables, arrays, etc. clear. Chapter 6, "Screen Graphics" and Chapter 7 "Sprite Graphics" give a good background in graphics. Chapter 8 "Sound Effects and Music" talks about the SID chip and the commands to make sound and music. It demonstrates as it goes along. Finally, Chapter 9, "Programming Hints," is for the user who is already comfortable with the computer and wants to go further. It covers debugging, ELSE statements, Getkey, TRON, TROFF, and much more.

So, when you start getting the inevitable questions from a newcomer, this is the way to go: Suggest that he join a users group; tell him about this neat little program (I am the C-128); help him through the tough parts; and

ATARI

Applying The Atari

by Jeff Brenner

This month we'll answer some reader mail, look at some user group newsletters, and type in a program submitted by a reader in response to a programming challenge suggested in the June 1987 column.

Atari News

"Where in the world are Atari's new Mega STs?" is the popular question nowadays. Taiwan might be the closest answer. From what I can gather from Atari spokespersons, here is the story: Apparently, the new Mega STs were manufactured in Taiwan and are now on a boat that has been heading towards American shores for the past eight months (obviously a wind-powered boat). Will we see the Mega STs or the Atari PC by Christmas of this year? For Atari's sake, let's sure hope so. And how about the XEP80 display box promised for early summer or the SX212 1200-baud modem? Or the Atari XE game system that many are hoping will bring about a revival of 8-bit software products? The Atari community has grown tired of the promises and press releases—Come on, Atari Corp., let's see the products!

Reader Mail

Dear Jeff:

Regarding the problem one of your readers had loading an Electronic Arts program: It sounds like the reader contacted someone new at Electronic Arts. Translator disks do not work for any E.A. programs. If you have an E.A. program meant for the Atari 400/800 computers and use it on the XL/XE series (or vice versa) you will

get the message, "Remove Custom OS" and you must use the correct computer or RETURN the program to E.A. for an exchange. Using a translator won't get you past the E.A. symbol.

I should also mention that the same problem will occur if you use Newell OS. But the fix is easier. If you bought the switch with the OS you turn off the computer and switch back to the XL/XE OS. If that doesn't work, you have to get the correct software for the Atari XL/XE.

John Pilge
Soquel, California

Thank you for your explanation. Since the reader with the loading problem had mentioned that the manual made reference to holding down the OPTION button (thereby implying XL/XE compatibility) I had concluded that the translator diskette would probably not be of any help. Often, highly protected programs will perform an OS checksum or will ensure that the OS code is ROM and not RAM before executing. This protection scheme was employed to ensure that no monitors or routines were lurking around in the OS memory area, awaiting to examine or copy programs loaded into the computer. Unfortunately, programs that make this check will not run with a translator diskette, as is apparently the case with older E.A. software, since the translator essentially gives your XL/XE a RAM-based operating system.

Dear Jeff:

Below are modifications that I have made to your Program Perfect, the program used to check typing errors while entering programs from Com-

continued on page 186

ATARI

Applying The Atari continued from page 179

puter Shopper. The modifications allow you to load a file from *Computer Shopper*. Use a GOTO 30000 to start Program Perfect. Enter the starting number and if the line number had been entered previously it will be displayed. Enter the checksum code as before, hit RETURN, and the program will check to see if the line was entered correctly.

Program notes:
 line 30380 has 23 <ESC>
 <SHIFT><DELETE> within the " "
 (23 single characters should appear.)
 line 30400 has 4 <ESC>
 <INSERT> within the " " (4 single
 characters should appear.)
 30060 GOTO 30380
 30350 NEXT I:PRINT
 CHR\$(125):FOR I = 30300 TO 30400
 STEP 10:PRINT
 I:NEXT I
 30380 POSITION N2,4:-
 PRINT "

```
30390 POSITION N2,4:LIST ST
30400 POSITION N2,5:?
" ":POSITION N2,5:PRINT "--
"; st;:POKE
N85,N2:PRINT "-";CHR$(30); :FOR
I = N1 TO 3:GOTO 30070
```

Carl Tribble
 South Bend, Indiana

Thank you for sharing the modification. Readers who are not familiar with Program Perfect should see the end of the column for information on obtaining a copy.

Newsletters

In the mail this month comes POKEY, the newsletter of the Western New York Atari Users Group (P.O. Box 59, Buffalo, NY 14216, membership: \$15/yr.) The July issue contained an article on Turbo BASIC tips, Atari rumors and news, reviews of Toadwar 2000, 221B Baker Street and VIP Pro-

fessional, and a tutorial on SpartaDOS.

Runes is the newsletter of M.A.G.I.C. the Midwest Atari Group—Iowa Chapter (P.O. Box 1982, Ames, IA 50010-1982, membership: \$15/yr.) The July issue contained Atari news and rumors and reviews of Speed King and Ogre.

SPACE Probes is the newsletter of the SouthCentral Pennsylvania Atari Computer Enthusiasts (P.O. Box 11446, Harrisburg, PA 17108-1446). The July issue contained an article on Pascal tips, and articles on two 8-bit emulators for the ST.

The newsletter of the Atari Users Group of Knoxville (c/o Bill Brosey, 953 Roderick Rd., Knoxville, TN 37923) contained Atari news and an article on Turbo BASIC.

The newsletter of the A-Bug-Byte User's Group (10781 W. National Rd., Brookville, OH 45308, membership: \$18/yr) contained 8-bit emulator news, and a review of the Avetex 1200 and 1200HC modems.

The Pokey Press is the newsletter of the Atari Computer Club or the Palm Beaches (605 S.W. First Ct., Boynton

Beach, FL 33425). The summer issue contained an article on the 1050 Duplicator, reviews of Superman, Phantasia and Roadwar 2000, and several 8-bit articles.

The Puget Sound Atari News is the newsletter of the B.R.A.C.E., KC-Ace, "R"-Atari, S*P*A*C*E, Star-Base, STDIO and T.R.A.C.E. User Groups (c/o S*P*A*C*E, P.O. Box 110576, Tacoma, WA 98411-0576). The attractively designed magazine-style newsletter contained Atari news, reviews of Flight Simulator II, Cardiac Arrest, Age of Adventure, Mail Order Monsters, Ogre, Battlecruiser, Easy-Draw, Dac Easy Accounting, Publishing Partner, ABC Basic Compiler, Lightspeed C, and others. The issue also contained articles on 1050 drive repair and on extending the ST DMA port.

English to Number Converter

In the June 1987 column I presented a subroutine that converted numeric values into their written English equivalents for use in the Electric

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COMMODORE

Getting The Most From Your C-128 continued from page 184

thing to the computer. After that, move the cursor back up and across the name just like you used to do on the C-64 but don't type ,8,1. Use the space bar to blank out the second quote sign and the PRG following the program name. This time when you hit return

it will load the program. It sounds more complicated than on the C-64 but it has the advantage of not having to type ,8,1 and it's better than having to type in a whole program name. You can also type RUN (you can't use F6) in front of the program, wipe out

everything after the name, and hit return. This will load and run the program.

Construction Program

As you know, I have been asking if anyone knows of a good swim meet management program that will operate under any DOS. We are still looking. I also have a reader looking for a "Construction Program." He is a contractor and would like a program that would help in job costing, timing, and bookkeeping. On this one we need

it to operate on a C-128. There must be some good ones out there in CP/M. Let me hear from you if you are aware of any programs like these or if there are some programs that you are searching for.

For more information on "I am the C-128" contact Activision Software Inc., 2350 Bay Shore Pkwy., Mountain View, CA 94043. For more information on Word Writer 128, contact Timeworks Inc., 444 Lake Cook Road, Deerfield, IL 60015.

BASIC 7.0 COMMANDS V2.2

C-128, most used
 Compiled by Greg & Pat Tillery

Direct Mode (The C128 uses all BASIC 2.0, 3.5, 4.0, & 7.0 commands)
 F-keys F1=Graphics F3=DIR F5=DSAVE F7=List
 F2=DLOAD F4=CLR/NEW F6=RUN F8=Monitor

Auto line feed AUTO (# Between lines)
 Boot a file BOOT "filename"
 Collect similar to "V" COLLECT (or ON U9)
 Combine 2 SEQ files CONCAT "add file" TO "masterfile"
 Copy same file, same disk COPY "FILENAME" TO "NEWNAME"
 Directory F3 or LOAD "\$",8 then list
 Directory, print—(after load) OPEN4,4,7:CMD4:LIST:CLOSE4
 Error Check (Flashing Green) PRINT DS\$
 Format a new disk (Both sides 1328 blocks free) HEADER "DISKNAME.ID"
 Initialize OPEN15,8,15:PRINT#15,"I":CLOSE15

LOAD, basic
 LOAD using BASIC 2.0 LOAD "filename",8
 LOAD using BASIC 7.0 DLOAD "filename (F2 key or spell out)"
 LOAD & RUN using BASIC 7.0 RUN "filename"
 LOAD, 0:* quickly SHIFT RUN/STOP

LOAD, machine language
 LOAD using BASIC 2.0 LOAD "filename",8,1
 LOAD using BASIC 7.0 BLOAD "filename"
 LOAD using BASIC 7.0 BLOAD "filename",Bbank,Paddress
 LOAD & RUN using BASIC 7.0 BOOT "filename"

AUTOBOOT Programs
 To autoboot after starting BOOT
 To autoboot before starting Turn on or reset <disk is in drive

M/L Monitor, enter F8
 M/L Monitor, get out of monitor mode X

Rename RENAME "OLDNAME" TO "NEWNAME"
 Run, runs program already in memory RUN
 SAVE, using BASIC 2.0 SAVE "filename",8
 SAVE, using BASIC 7.0 DSAVE "FILENAME (Device # optional)"
 SAVE (Machine language) BSAVE "FILENAME (8,1+BEG&ENDING ADD)"
 SAVE & replace (have room for both) DSAVE "@FILENAME (DEVICE #OPTIONAL)"
 Scratch files SCRATCH "FILENAME"
 Unscratch files Unscratch program on Test/Demo

Scroll, stop NO SCROLL key or CNTRL S
 Scroll, restart NO SCROLL key or CNTRL Q

Speed, CPU clock speed
 Fast speed (40 col screen off) FAST
 Slow speed (40 col screen on) SLOW

Verify DVERIFY "filename"

Verify last program saved (wont work <DSAVE "@") DVERIFY "*" 1571 .Lock in OPEN 15,8,15:PRINT#15,"UO>M1" 1541 .Lock in OPEN 15,8,15:PRINT#15,"UO>MO"

DOS Shell
 RUN A PROGRAM—FORMAT A DISK—CLEAN UP A DISK—COPY A DISK—COPY FILES DELETE FILES—RESTORE FILES—RENAME FILES—REORDER DIRECTORY (to start—F7)

Hardware DIPS
 Device #8 Left up, right up
 Device #9 Left down, right up

Error Messages
 OK Not an error
 01 File(s) scratched (not an error)
 20 Read error, block header not found
 21 Read error, No sync character found
 22 Data block not present
 23 Read error, checksum error in data block
 24 Read error, byte decoding error
 25 Write error, write verify error
 26 Write protect on
 27 Read error, checksum error in header
 28 Write error, long data block
 29 Disk ID mismatch
 30 Syntax error, general
 31 Syntax error, invalid command
 32 Syntax error, lone line
 33 Syntax error, invalid file name
 34 Syntax error, no file given
 39 Syntax error, invalid command
 50 Record not Present
 51 Overflow in record
 52 File too large
 60 Write file open
 61 File not open
 62 File not found
 63 File exists
 64 File type mismatch
 65 No block
 66 Illegal track or sector
 67 Illegal system t or S
 70 No channel available
 71 Director error ('i' to correct)
 72 Disk full
 73 DOS Mismatch CBM DOS V3.0 1571
 74 Drive not ready

Working Software, Inc. Announces Findswell

Working Software, Inc. recently announced Findswell, a \$49.95 document locator, opener and path saver for Apple Macintosh computers.

Findswell is an enhancement to the Macintosh System, and offers improvements over file locaters. Findswell users do not have to leave the "open box" and use a desk accessory. Documents and folders can be opened directly from Findswell. Findswell remembers the path to documents and folders, (an MSDOS convenience not previously available to Macintosh owners).

Findswell is placed in the System Folder. A "Findswell" button is added to the "open box" of every Macintosh program. The user types all or part of a document or folder name and presses the "Find" button. Documents and folders matching the description are presented.

Once a document or folder is located, the user is shown the date and time of last modification to the document, the document's size and the program that created it. The user can double-click the name of the document or press "Open"

and the document will open. The user can also double-click on a folder name to return to the "open box," in that folder.

Remembered folders and documents are accessible without having to perform a

locate operation. Frequently used document and folder names can be remembered by placing a checkmark next to the name. Each time Findswell is used, these remembered names appear and can be

opened without requiring a search.

Findswell will be advertised with a "Finders Keepers, Losers Weepers" campaign.

Working Software, Inc. also markets the Spellswell spelling

checker and proofreader, and the Spellswell Medical Dictionary.

For further information contact Findswell, 321 Alvarado, Suite H, Monterey, CA 93940; 408-375-2828.

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Checkbook program. I also suggested, as a programming challenge, that readers attempt to design a program that will convert words into their numeric equivalents. The first person to respond to this challenge was K. Dwaine Williams, of Odin, Illinois, who, ironically, does not even own an Atari computer. K. Dwaine writes:

I read your article in the June *Computer Shopper* and decided to send you a couple of my programs. First of all, I do not own an Atari computer. I use an IBM clone that we assembled. I use MSDOS 3.2 and GWBASIC 3.2. Most of the things I do in BASIC you should be able to do with the Atari. The only thing I am not sure about is, if you can use tables as I do. I use tables to hold data instead of data and read statements.

For example:
 B\$(1) = "ONE";
 B\$(2) = "TWO."
 If I say NUMB\$ = BB\$(2)
 then
 NUMB\$ equals the value "TWO"

Thus, it is easy to convert a number to English.

After reading your article I then wrote the program to convert English words to numbers. The only problem is if you

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TANDY ADD-ONS

10 Meg Hard Card



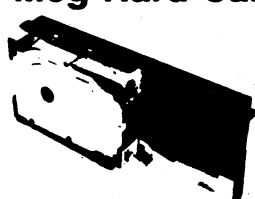
\$379.95

20 Meg Hard Card



\$459.95

30 Meg Hard Card



CALL

HARD DISK SALE!
New Low Prices!



Hard Drive Kits

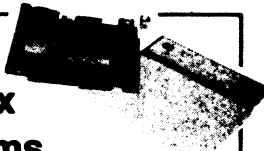
10 Meg	\$279.95
20 Meg	\$339.95

TANDY 1000 EX

2nd Drive

\$179.95

Everex Modems



(Hayes Compatible)

Complete with software manuals

300/1200 Internal	\$119.95
300/1200/2400	\$199.95


TANDY 1000

Cards

300/1200 Modem	\$119.95
300/1200/2400 Modem	\$199.95
Mini IO	\$79.95
2 Meg Board	\$169.95

2nd Floppy

360K	\$119.95
720K	\$99.95
3 1/2"	\$119.95



Memory Cards

Zucker Memory

- DMA & 512K **\$129.95**

Zucker Multifunction

- Serial
- Real Time Clock
- 512K DMA
- Software **\$189.95**

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Hard Drive Kits

Includes Drive, Controller & Cable

20 Meg	\$399.95
30 Meg	\$599.95
40 Meg	\$699.95
80 Meg	\$999.95

Tandy Model 3, 4, 4P

Hard Drive Systems

Complete - ready to run

10 Meg	\$499.95
20 Meg	\$699.95

Tandy 1000, 1000SX, 3000 & 3000HL

Tape Backup

20, 30, 40 Meg Tape Backup	\$399.95
60 Meg Tape Backup Archive	\$659.95



BODEX CORP.
 224 E. Main Street
 Marlboro, MA 01752
Tel. 617-485-5115
 Hours: 10 a.m.-7 p.m., Sat. 10 a.m.-5 p.m.

TRUE DATA PRODUCTS
 115 So. Main Street
 Uxbridge, MA 01569
Tel. 617-278-6555
 Hours: 9 a.m.-6 p.m., Sat. 10 a.m.-4 p.m.

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allow messages to be input as one continuous string, without <enter> [required after each line]. [Also,] two screens, one forty column that shows what the caller sees, and a second 32 column screen under the Sysop's control to display status, etc. The Sysop will be able to switch back and forth at will.

"The assembly portion will handle the message base directly, allowing the size of a message to be limited only by the disk space and freeing up a good deal of BASIC programming space. There will also be a routine that searches a file for a string," he said.

Much like Omega, such a routine would introduce some new features to the user that had not previously been seen in the TI world. And the BBS routine will also probably end up public domain, said Watford. "I'm programming for fun, and maybe recognition," Watford declared. Besides, he added, there is probably little money to be made through a commercial effort. "Others have [almost] convinced me that public domain will eventually hurt the TI community. [Hence,] future offerings may be done differently."

Watford was apparently referring to the argument that the presence of public domain programs of commercial quality will run commercial pro-

grammers and distributors out of the market—and with them, other programs that do not have public domain counterparts.

Charlton Also Hard At Work

Although BBS and pay network usage may be down, it seems that telecommunications utilities continue to appear. Paul Charlton, Myarc programmer and developer of the fairware Fast-Term terminal emulator (some would say that Fast-Term is the standard by which all other terminal emulators are judged in the TI world), is hard at work on a project that has interesting possibilities.

Charlton describes his newest program as "...a com-

mand language for Fast-Term which will let you write programs and do anything from the program which you can normally do from the keyboard...you could write a BBS in this language." Stay tuned for more details of this as they become available. Charlton cautioned that the project is far from done.

9640 Speculation Continues

The 9640 review is on the way—as soon as the 9640 arrives, the reviewing can begin. Recent operating system problems have slowed the release of the Myarc machine (also affectionally called the Geneve), but the OS is rumored to be near its first completion (Version 1.0), including full

TI-99/4A emulation. Since the operating system is disk-based, updates can be easily released to registered users of the computer.

On CompuServe's TI Forum, a heated exchange continues as to the impact the 9640 can have on the TI world and the computing world in general. Overall, the mood seems to be one of tolerance and expectation. "If they are able to get the thing off the ground and have a decent marketing plan," said forum member Jeff Bunting, "then it just might take off...Only time will tell."

Both Bunting and Cynthia Becker, a 99'er from Seattle,

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misspell a word you get a wrong answer. This program, like your number to English one, works with groups of three numbers starting at the low position.

I also try to use structured programming, starting at the top and working downward. I use GOSUBs to leave the routine where at and then come back to the same place. And I try to use GOTOS only to move downward within the

same routine. I also use GOTO to go back to the top to do another problem.

*K. Dwaine Williams
Odin, Illinois*

Many thanks for sharing your program. I have modified the program so that it will work on an 8-bit Atari. String handling is the major difference between 8-bit Atari BASIC and GWBASIC. Subscripted strings do not exist in Atari BASIC, so these had to be simulated with one big string (Q\$). Also, lines contain-

ing string functions had to be modified to perform the proper string manipulation in Atari BASIC. A comparison of the differences between Atari BASIC and Microsoft BASIC with a discussion on how to convert one to the other would be a good topic for a future column.

Using Program Perfect, type in the English to Number Converter and RUN it. You will be asked to enter a written number. Type in the number and press Return. The computer will respond with the

numerical equivalent. Be sure to spell out all numbers correctly, and to appropriately add hyphens or the word "AND." See the following examples:

You Type: Two Hundred Sixty-Three Thousand

Computer: 163,000.00

You Type: Four Million Two Hundred Thousand Three Hundred Fifty-Eight and 10/100

Computer: 4,200,358.10

Next Month

More reader mail, Atari news and 8-bit programs.

Readers' questions, comments and contributions are welcome. Please enclose a self-addressed, stamped envelope (SASE) for a personal reply. "Program Perfect" is a utility used to check for typing errors when entering programs from this column. Readers can send \$5 for a diskette or a SASE for a listing of this program.

Address all correspondence to: *Jeff Brenner*, "Applying The Atari 10/87", c/o *Computer Shopper*, P.O. Box F, Titusville, FL 32781-9990. ●

ENGLISH TO NUMBER CONVERTER

```

DTJ 10 REM ENGLISH TO NUMBER CONVERTER
WPJ 20 REM COPYRIGHT 1987 DWAIN WILLIAMS, USED BY PERMISSION
RSJ 30 REM ATARI VERSION BY JEFF BRENNER
NJJ 40 OPEN #1,4,0,"K:"
PVJ 50 DIM Q$(320),A$(100),R$(32),ANS$(100),CMP$(100),TMP$(100),TMP2$(100)
DGJ 60 DIM NUM1$(100),CHK$(100),CHK1$(100)
MTJ 70 Q$(1)=CHR$(32):Q$(320)=CHR$(32):Q$(2)=Q$
NPJ 80 RESTORE 110:FOR I=0 TO 31:READ A$:Q$(I*10+1,I*10+LEN(A*))=A$
APJ 90 R$(I+1)=CHR$(LEN(A$))
XNJ 100 NEXT I
NJJ 110 DATA ONE,TWO,THREE,FOUR,FIVE,SIX,SEVEN,EIGHT,NINE,TEN,ELEVEN,TWELVE
OFJ 120 DATA THIRTEEN,FOURTEEN,FIFTEEN,SIXTEEN,SEVENTEEN,EIGHTEEN,NINETEEN
TDJ 130 DATA TWENTY,THIRTY,FORTY,FIFTY,SIXTY,SEVENTY,EIGHTY,NINETY,HUNDRED
MNJ 140 DATA THOUSAND,MILLION,BILLION,TRILLION
QPJ 150 PRINT "ENTER WRITTEN NUMBER TO CONVERT:"
KNJ 160 INPUT #16;A$
WBJ 170 L=LEN(A$):FS=0:FD=0:NUM1$=""
FDJ 180 FOR X=L TO 1 STEP -1
ILJ 190 IF A$(X,X)="/" THEN FS=X:GOTO 220
HOJ 200 IF A$(X,X)="-" THEN FD=X:GOTO 230
YEJ 210 NEXT X
GNJ 220 IF FS>0 THEN GOSUB 900:GOTO 260
GGJ 230 IF FD>0 THEN GOSUB 970:GOTO 260
YMJ 240 IF X=0 AND FS=0 AND FD=0 THEN NUM1$=".00"
TNJ 250 IF X=0 THEN X=L
TOJ 260 ANS$="":CMP$="":CNT=1:DIG=0
FRJ 270 FOR Z=X TO 1 STEP -1
GLJ 280 IF A$(Z,Z)=CHR$(32) THEN GOSUB 390:GOTO 310
TDJ 290 IF A$(Z,Z)="-" THEN CMP$="Y"
DJJ 300 TMP$=ANS$:ANS$=A$(Z,Z):ANS$(LEN(ANS$)+1)=TMP$
YHJ 310 NEXT Z
EJJ 320 GOSUB 390
KCJ 330 PRINT :PRINT :PRINT NUM1$:PRINT :PRINT
GJJ 340 PRINT "ENTER ANOTHER NUMBER (Y/N)?":GET #1,N:PRINT :PRINT
SUJ 350 IF N=89 THEN 150
VGJ 360 IF N=78 THEN END
BQJ 370 GOTO 340
FWJ 380 END
MPJ 390 LL=LEN(ANS$)
EJJ 400 CHK$=ANS$
JRJ 410 IF CHK$(LEN(CHK$))=CHR$(32) THEN CHK$=CHK$(1,LEN(CHK$)-1)
ELJ 420 ANS$=CHK$
GNJ 430 IF CMP$="Y" THEN GOSUB 450:ANS$="":RETURN
RKJ 440 GOSUB 560:ANS$="":RETURN
OTJ 450 FOR V=1 TO LL
MQJ 460 IF ANS$(V,V)="-" THEN 490
YKJ 470 NEXT V
BCJ 480 RETURN
WFJ 490 CHK$=ANS$(V+1,LL)
TXJ 500 CHK1$=ANS$(1,V-1)

```

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EJJ 510 GOSUB 560
FXJ 520 CHK$=CHK1$
ELJ 530 GOSUB 560
WMJ 540 CMP$=""
BAJ 550 RETURN
EHJ 560 FOR K=1 TO 32:KK=K-1
LHJ 570 IF Q$(KK*10+1,KK*10+ASC(R$(KK+1)))=CHK$ THEN 600
YBJ 580 NEXT K
BEJ 590 RETURN
FFJ 600 IF K>27 THEN GOSUB 740:RETURN
UBJ 610 N=K:IF N>19 THEN GOSUB 710
IVJ 620 IF N>9 THEN CNT=CNT+1:DIG=DIG+1
FLJ 630 CNT=CNT+1:DIG=DIG+1
RHJ 640 TMP$=NUM1$:TMP2$=STR$(N)
HBJ 650 IF N<10 THEN NUM1$=TMP2$(1,1):NUM1$(LEN(NUM1$)+1)=TMP$
FRJ 660 IF N>9 THEN NUM1$=TMP2$(1,2):NUM1$(LEN(NUM1$)+1)=TMP$
TIJ 670 IF Z<1 THEN 700
IFJ 680 TMP$=NUM1$
JYJ 690 IF DIG/3=INT(DIG/3) THEN NUM1$=",":NUM1$(LEN(NUM1$)+1)=TMP$:CNT=1
AXJ 700 RETURN
GKJ 710 IF CMP$="Y" THEN N=K-18:RETURN
EZJ 720 N=(K-18)*10
BAJ 730 RETURN
GVJ 740 VA=0:IF CHK$="AND" THEN RETURN
QMJ 750 IF CHK$="HUNDRED" THEN VA=2:VA=VA+DIG-(CNT-1)
BVJ 760 IF CHK$="THOUSAND" THEN VA=3
XVJ 770 IF CHK$="MILLION" THEN VA=6
XOJ 780 IF CHK$="BILLION" THEN VA=9
EBJ 790 IF CHK$="TRILLION" THEN VA=12
QRJ 800 IF VA-DIG=0 THEN RETURN
LJJ 810 DIFF=VA-DIG
TRJ 820 FOR T=1 TO DIFF
LVJ 830 TMP$=NUM1$:NUM1$="0":NUM1$(2)=TMP$:DIG=DIG+1
GDJ 840 CNT=CNT+1
UYJ 850 IF DIG>0 AND DIG/3=INT(DIG/3) THEN 870
CDJ 860 GOTO 880
DNJ 870 TMP$=NUM1$:NUM1$=",":NUM1$(LEN(NUM1$)+1)=TMP$:CNT=1
YNJ 880 NEXT T
BHJ 890 RETURN
JGJ 900 FOR Y=X-1 TO 1 STEP -1
TFJ 910 IF A$(Y,Y)=CHR$(32) THEN 940
YHJ 920 TMP$=NUM1$:NUM1$=A$(Y,Y):NUM1$(LEN(NUM1$)+1)=TMP$
YOJ 930 NEXT Y
NFJ 940 TMP$=NUM1$:NUM1$=",":NUM1$(LEN(NUM1$)+1)=TMP$
UMJ 950 X=Y-1
BFJ 960 RETURN
CAJ 970 NUM1$=""
RHJ 980 FOR Y=X+1 TO L
TCJ 990 NUM1$(LEN(NUM1$)+1)=A$(Y,Y)
AZJ 1000 NEXT Y
XTJ 1010 X=FD-1
DFZ 1020 RETURN

```

ATARI The Multi I/O Box From ICD Corp.

Reviewed by John Nagy

There is nothing revolutionary about the Multi I/O Box. Every function it performs has been done before, but...WOW! What A Great Combination! ICD's MIO amounts to much more than the sum of its parts.

This latest (and perhaps last) of the many third-party additions for Atari's 8-bit computer line is part external RAMdisk, part printer interface, part printer buffer, part modem interface, part hard disk interface, and (soon) part video controller for 80 column display. Did I miss anything? Only that it is externally powered, allowing "permanent" RAM memory independent of your computer. And that it can control your Atari-type floppy drive assignment. And it may allow networking and file serving to and from multi-

ple hard drives. And it comes in two flavors, 256K or One Meg.

Most of these functions can be had by adding various gizmos and upgrades and thingees... but putting them all together in one integrated package has resulted in the most useful accessory I have yet used with my Atari. In fact, I sold my second disk drive from my main system (multiple drives and multiple systems being the insignia of a "serious user") and haven't missed it yet, while using my system more than ever.

The MIO is a small grey box with a gaudy purple logo. It's 9½ inches long, 1½ inches tall, and 6 inches deep, sits behind your Atari 800XL or 130XE, and does something that nothing else ever has: it plugs into the mysterious Expansion Buss. This is a bit of a trick on the 130XE, because

the cartridge slot and expansion buss have shared contacts. ICD solves this with an additional card that pushes into the XE and passes the buss to the MIO while breaking out to two vertical cartridge slots. The sockets are in parallel, so they may only both be used if the cartridges are designed to co-exist (like the ICD R-Time 8 clock cart of ICD's SpartaDOS-X cart, which would otherwise stack). The buss cable is only 4" long to avoid extra shielding requirements, so placement is not something you have any choice about. On a bridge-type computer desk setup, the MIO fits quite comfortably under the monitor stand. For other users, desk arrangements may become tedious.

Connectors sprout from both ends of the unit—a Centronics standard parallel printer port and 50-pin SASI/SCSI hard drive interface to the right, and an Atari 850-type RS-232 serial connector, power plug, power switch, and a "video" port to the left. Two LEDs (one green power indicator and one red "busy" light) finish the short list of visible features.

A forty-five page owner's manual goes into quite a bit of detail on the setup and use of the MIO, along with even more technical information about what is going on inside the box. Also shipped with the MIO is a disk with ICD's SpartaDOS and a few hard drive formatting and partitioning utilities. Don't get too excited, the SpartaDOS sent has no accessory files nor the 175 page manual, and as such is just about useless. However, and despite many reviews claiming the reverse, SpartaDOS is not required for use of the MIO. Even though you would do very well to buy and use SpartaDOS, as it is the most powerful disk operating system available, you can do very well (within limits) with just about any DOS. I tested DOS 2.0, 2.5, SmartDOS, and MYDOS, and each worked fine, although several could not address the entire memory of the MIO due to their inability to count more than 707 or 999 sectors. But ICD wrote the remarkable SpartaDOS, and designed the MIO to make the most of it, so spend the extra and get a full copy of SpartaDOS too (\$39.95) retail and widely discounted).

What It Does

You walk up to your computer. It, and your entire

system, are off. A single green LED shines from below your monitor. Turn on your main power, and by the time your instant-on monitor can give you screen, DOS is loaded and looking at you. Type "EXP" and the 260+ sector 850 Express! terminal program loads and is running before you can pull your hands away from the keyboard. You went from cold system to on-line in under six seconds!!! Decide you want to do some word processing? Press Reset, type "TEX," and in two seconds (!!!) you are inside TextPro. And the disk drive never came on. It's so fast that you can actually capture a file from a BBS, go off-line to edit it with the word-processor, and reload your terminal to upload the result all in one session and not feel you are hogging the BBS.

This is the MIO in action. Even faster than a hard drive, the 256K or One Meg MIO can hold all your normal applications software for instant access. How many times have you not done something to a file because it was too time consuming to find and load the sector editor or word processor or... They can all sit in the MIO, a keypress and one breath away.

In my 256K system, I have Express!, TextPro, a sector editor and disassembler, a spelling checker (with a 5,000 word dictionary), ARC DE-ARC, and Scrunch utilities, SpartaDOS and its entire utility kit, a phone number database, a few random hi-impact demos, and still have 165 free double density sectors of room. Oh, and I'm not using all the memory for RAM—I have 32K reserved for the printer buffer. Imagine what you would do with a MEG of instant access!

The adjustable size printer buffer also allows you to print multiple copies of a document while you play Star Raiders or even turn the computer off. The Centronics printer port is fine for most printers, but you can use the serial port as a printer port as well, and still use the buffer. An improved resident R: handler for the serial port both saves 2K of computer memory and allows more flexible I/O to the modem (you can stay in concurrent I/O mode and access the disk or printer—impossible on an 850).

Wait a minute, you say, if I am booting from the MIO "disk," how can I run boot disks or commercial software?

Easy. The MIO controls all disk device routing even though the "daisy chain" is not plugged into it. From a simple configuration menu (accessible by pressing reset/select), you tell the MIO what to call each drive, regardless of what number the drive is assigned internally. Yes, your Percom can even be called D8: if you like, and you can swap them around even while DOS and your application program stays in place. This way, you can reassign a drive number after the program loads—very useful for making the most of RAM Speed for normally disk-bound programs. (A spell checker, reading and writing to RAM, flies along in eerie but lovely silence.)

Since I run a 256K upgraded 800XL, I was glad to find no conflict with internal RAMdisk use. Although you can't reassign the drive number from the MIO, any RAMdisk software that satisfies your DOS will work fine. In my normal setup, I have the MIO as drive 1, my Happy/1050 as drive 2, and one or two internal RAMdisks as 3 and 4. Who needs another physical drive? The only time I miss it is when I want to duplicate disks, but copying to RAMdisk and back to disk is only seconds slower than disk-to-disk.

The real payoff for the MIO is the hard drive port. Before the MIO, it was both difficult and very expensive to outfit a hard drive for the 8-bit Atari. ICD's package gets you all the above features and a hard drive for under \$500. Here's how the prices work out, assuming you buy the parts right (like from *Computer Shopper* ads):

256K MIO (who needs a MEG in front of a HARD DRIVE?)	\$160
10 MEG hard drive (bare)	\$120
Drive controller card (SASI/SCSI, NOT IBM type)	\$120
Hard drive case and power supply	\$ 80
Dark Sun glasses (remember, you are now COOL!)	\$ 10
— total:	\$490

Remember that you are likely to be able to replace a drive and your 850 in the process, so the NET cost could be surprisingly small.

If you don't want to spend your effort scaring up the components and cables (available locally), and an hour or so assembling and setting up the drive, ICD now sells complete drive units ready to run (20 MEG, with internal clock/

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Hard Drives

ST-225 KITS 20 MEGABYTE 65 msec	\$279
ST-238 KITS 30 MEGABYTE 65 msec	\$319
ST-4038 FH 30 MEGABYTE 39 msec	\$489
ST-251 HH 40 MEGABYTE 39 msec Format Software	\$429
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Multi I/O Box
continued from page 366

calendar) for about \$650, MIO not included.

Everything you ever heard about hard drives is true. They are wonderfully fast to read and write, and seem bottomless pits of storage. For any serious applications or BBSs, they are indispensable. I run a 10 Meg for our C.H.A.O.S. Atari club BBS, but my "own" system gets along quite nicely without one, and I will bet most people can do without. The MIO fills the primary need for space and access for only the price of a second 1050.

ICD is promising an add-in card that will allow the MIO to drive monochrome and RGB monitors in 80 clear columns, and should be generally software compatible with the Atari XEP-80 box (assuming it becomes available). ICD's Tom Harker told me it is on the back burner until SpartaDOS X (the cart version) is finished and released. Another sidelined project is the networking option for multi-use of a hard drive as a file server. The fate of this option looks fairly dim.

How It Performs

As you can tell, I really love my MIO. It has increased my productivity and enjoyment more than I would have believed possible from the product descriptions. The memory is very stable. I have not had a memory error in several months of operation 24 hours a day on the BBS. The password file is in RAM (yes, I back it up!) but has never had a slipped bit yet. But the unit is not flawless. Obviously, if the power fails, it's gone, and a battery backup has yet to be designed.

If you use a translator disk for any reason, you lose all access to the MIO, your modem, and the printer. This can't be helped, as the original 800 that you are emulating with a translator had no expansion buss.

Many user group newsletters have had scare reports of one dead MIO after another, although they also credit ICD with good replacement attention. I know of about 10 units in use—and one of the owners had two go bad in the first day. The others have worked fine, although one of mine blew a fuse in the power supply (a sealed unit like the original 800) and since then resists any first attempt to format the MIO RAMdisk. I want to send it for service but can't bear to be without it...

A few users reported bugs in the internal ROM that prevent use with their particular printer. MIO bugs also keep it

from working with SYNFILE, a database package for the 8-bit Atari. It won't print, period. But ICD's Tom Harker assured me that these bugs have been fixed and would be included in a replacement ROM kit for all MIO owners. Other bugs being fixed include mostly printer buffer problems (losing the pointer, or locking up), and correcting incomplete RS-232 emulation. Expect this update to be available soon.

One thing that bothers me about the MIO operation is that any activity or change of buffer or RAMdisk configuration in the MIO wipes out all memory. Just pressing the key for size of buffer is all it takes

to blow your entire RAMdisk, regardless of whether you actually reset the size of the bluffer. Especially with a one-meg version, be careful! Why couldn't any new configuration take effect after the reset only if there is a net change in parameters?

I also feel that ICD should have included a complete SpartaDOS with the MIO. Although not required, it complements the operation of the MIO considerably.

Lastly, the placement required by the unit may present problems for some users in arranging their system, and the extender card for the XE is just

plain ugly (as is the purple ICD logo on the MIO itself!).

Recommendations

Buy it! It is easily the best performing and most useful new 8-bit Atari product in years. It actually cured my craving for an ST (although this may be a temporary situation!). The promised new ROM chip should take care of most bug complaints. It does appear that the MIO may be a bit fragile, as dead-on-arrival units are not uncommon. I give the MIO an A-minus overall. (I'm a hard grader.)

If you use two disk drives regularly, you are a candidate for a MIO. If you are in the

market for an interface, look no further! The difference in power offered by the MIO when compared to any other printer/modem interface far outweighs the likely \$100 difference in price. I would not recommend the MEG version, as most users won't find the extra 750K memory to be worth the \$100-\$150 additional cost.

The Multi I/O Box from ICD Corp. (256K, \$199.95, 1 MEG, \$349.95 list price)

Tom at ICD says they can't make the MIOs as fast as they are being ordered. And the reason is real power at a good price. Isn't that what Atari is supposed to be all about? ●



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